The NEW SUPER PRODUCTIVE 30 INCH TRIPLE GEARED LATHE

THE AMERICAN TOOL WORKS COMPANY
CINCINNATI · U·S·A

LATHES · RADIALS · SHAPERS

3000-B-30

VANDYCK CHURCHILL COMPANY
EXCLUSIVE AGENTS
1321 ARCH ST. - PHILA.

New Model "American" 30-Inch Super-Productive Lathe

FACE PLATE DRIVE

Built with Patented 16-Speed Triple Geared Head for Belt or Motor Drive

This new model lathe is the very last word in highly efficient, super-productive machines. It was designed with a view to producing a lathe sufficiently in advance of present day requirements to insure adequate capacity for future demands. In power, weight, dimensions, materials and refinements it is far in advance of anything the present market affords. It reaches the very highest pinnacle of lathe value, and we can conscientiously recommend this machine as being the surest, the safest, and the most profitable investment for the lathe purchaser.

PATENTED 16-SPEED TRIPLE GEARED HEAD

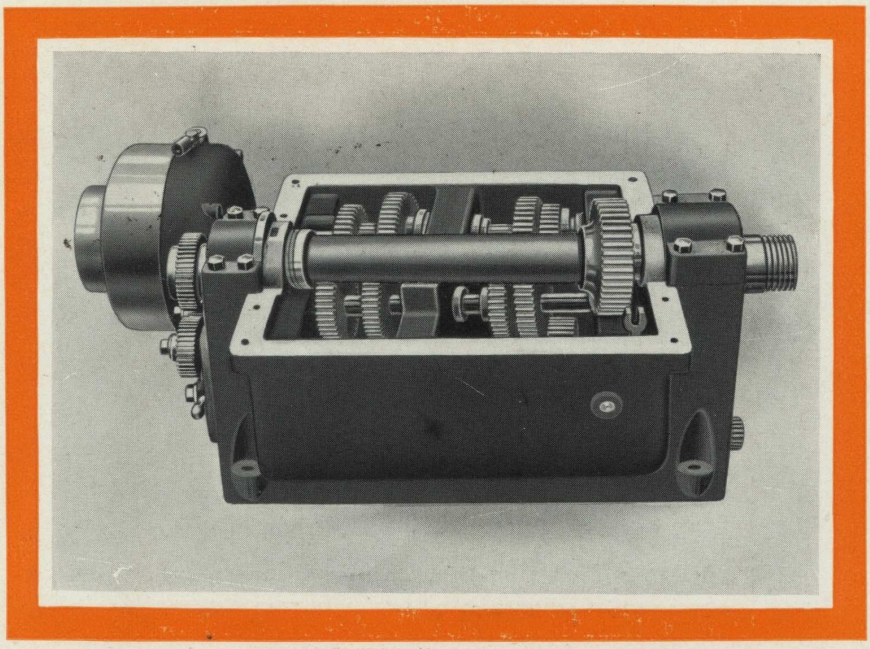
As an engineering achievement we point with particular pride to the new headstock designed for this lathe. It is the all geared, selective speed type, with both spindle and face plate drives, and can be either belt or motor driven. In the design of this new headstock we have embodied certain improvements of inestimable value to a mechanism of this kind, for example:

POWER

When belt driven, 25 H.P. is delivered to the driving pulley by the belt, while for motor-driven lathes we recommend motors from 20 to 25 H.P., depending upon the nature of the work.

FACE PLATE DRIVE

Probably the improvement of greatest importance is the new face plate drive. This new design provides 8 of the 16 spindle speeds through the internal gear face plate drive; only one-half or 8 spindle speeds are transmitted through the spindle gear, consequently for all severe turning operations the drive is through the powerful internal gear in the face plate. This feature cannot be emphasized too strongly. Its value will be better understood by comparing it with other designs, practically all of which transmit only one-third of the entire speed range through the internal geared face plate. As a consequence other



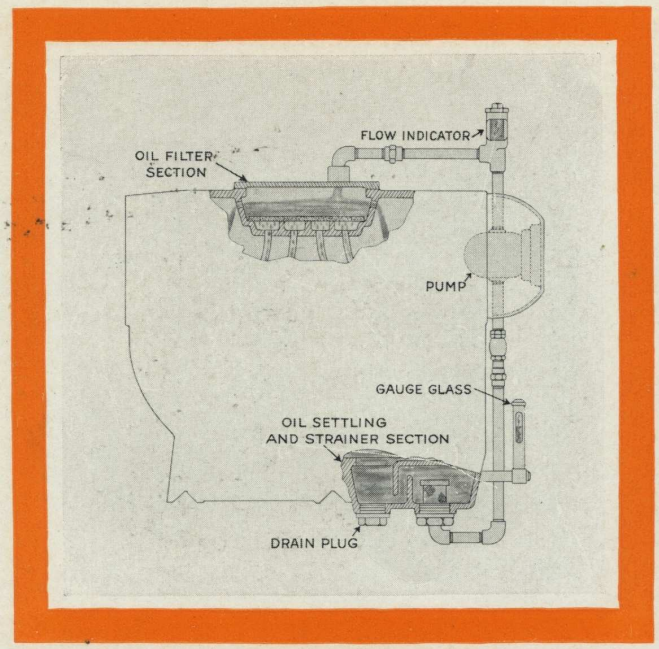
INTERNAL MECHANISM OF HEAD

designs are seriously limited as to the diameter of work which can be driven through the internal gear at economical cutting speeds. For example, the highest internal gear speed on the average lathe is approximately 10 R.P.M., while on the new "American" 8 speeds, up to and including 29.3 R.P.M. are secured through the internal gear. This maximum internal gear speed of 29.3 R.P.M. provides approximately 46′ cutting speed on a 6″ diameter, consequently it follows that all turning operations on diameters 6″ or larger can be performed through the internal gear drive at 46′ or greater cutting speed, the direct drive through the spindle being used only for comparatively light operations at high speeds. On other designs providing maximum internal gear speeds lower than 29.3 R.P.M., the smaller work diameters that can be turned on the "American" at economical cutting speeds must be handled either through the direct spindle drive or through the internal gear drive at a much slower and uneconomical cutting speed.

DURABILITY

The 16 spindle speeds are obtained through 18 gears, including the face plate internal gear and pinion, without the use of either friction or jaw clutches. All speed changes are made through slip gears, the only ones in operation at any time being those that are actually transmitting power, consequently there are no idle running gears or sleeves in the head to waste power or to stick or seize.

By removing certain driving units this head can be simplified for use with an adjustable speed motor, 8 mechanical speeds being provided after the simplification.



AUTOMATIC OILING SYSTEM

MATERIAL

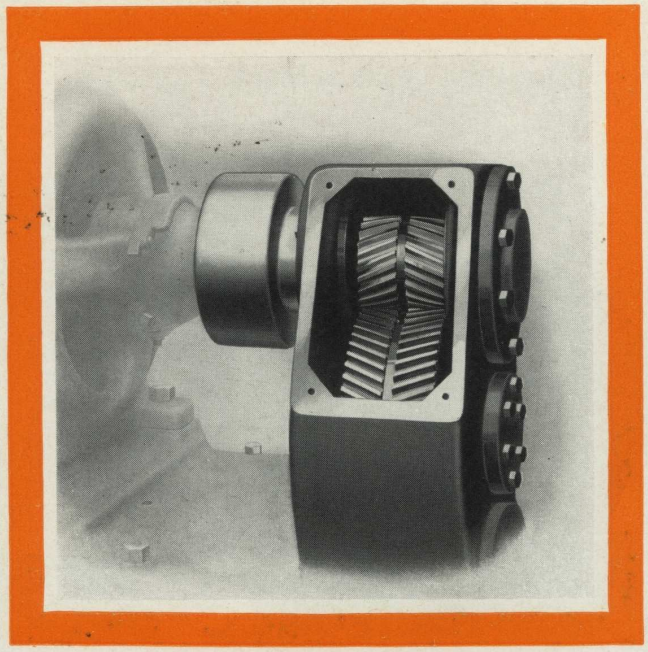
All gears in the head, including the triple gear and face plate pinion, are made of a high carbon chrome manganese steel, heat-treated and, excepting the large face plate internal gear, are hardened. After hardening, the bores are ground concentric with the pitch diameter by means of a special 4-jaw tooth segment chuck, which equalizes such slight distortion as may occur in the hardening process, thus producing gears the pitch lines of which will run true within one-half thousandth of an inch, even on the largest gear. The average tensile strength of these gears is approximately 200,000 lbs., and the Brinnell hardness about 385. Our method of treatment produces gears which not only have an extremely hard surface, which will not chip, but also a very tough core, which is practically proof against crystallization. The characteristics of these gears after hardening are well illustrated by the ability to bend one tooth against the other with a sledge hammer without fracturing them.

The spindle, and all other shafts in the head, are made of a high carbon alloy steel which is heat-treated before machining, and the spindle and shafts run in a special composition phosphor bronze, which has unusual wearing qualities.

The entire head is fully enclosed, every bearing is bronze bushed, and all bearings and all gear teeth are lubricated by our automatic oiling system.

AUTOMATIC OILING SYSTEM

The automatic oiling system, which has proven so successful on the smaller sizes of "American" lathes, has also been incorporated in this new head. The oil is pumped by a gear driven Brown & Sharpe oil pump from a reservoir at the bottom of the head to a distributing chamber in the top cover. Before the oil reaches the bearings it must pass through a felt filtering pad in the distributing chamber. It then drips into small reservoirs, from which it is fed through tubes to the various bearings. Each tube has its individual reservoir so as to pre-



MOTOR DRIVE

vent any one bearing from absorbing the oil intended for the other bearings. In other words, the oiling is really selective in the sense that each tube receives its proportionate amount of oil.

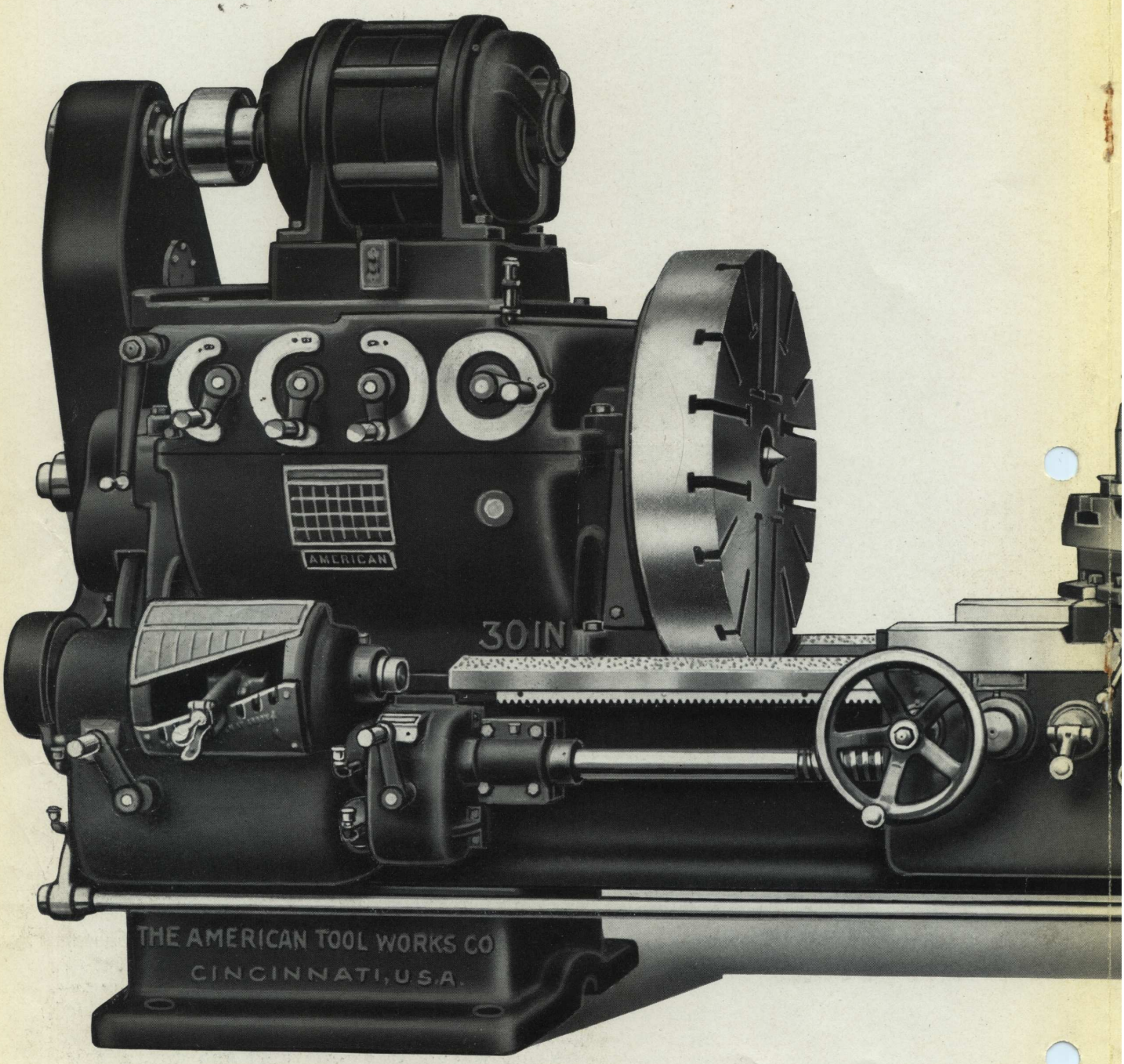
A sufficient overflow from the distributing chamber also lubricates the gears. The oil then drains back into a suitable settling basin, from which it overflows into the primary filtering chamber, and is then drawn through a fine wire mesh filter, and again pumped to the top of the head. Thus a copious flow of clean oil continuously lubricates all of the mechanism in the entire head. This system is manifestly superior to either the splash system or the "hit or miss" squirt-can system of oiling.

The spindle bearings are supplied with lubricant directly from the pump, the oil passing through a purolator and going to the spindle bearings under pressure.

From the foregoing it will be evident that the entire head mechanism is as nearly fool-proof and accident-proof as possible, the only attention required being an occasional cleansing and renewal of the oil supply. Otherwise the entire mechanism in the head is self-sustaining, as the gears are practically indestructible.

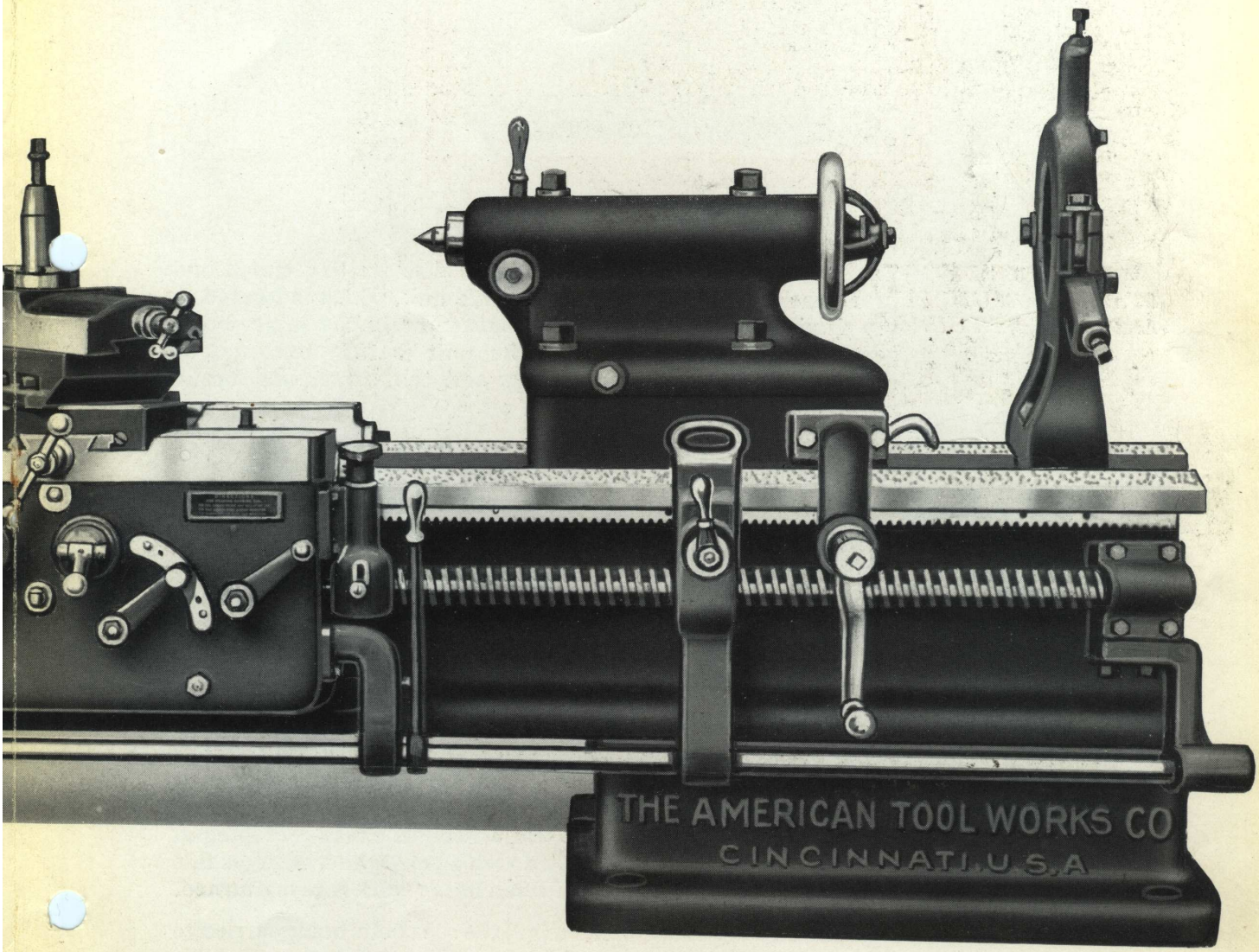
MOTOR DRIVE

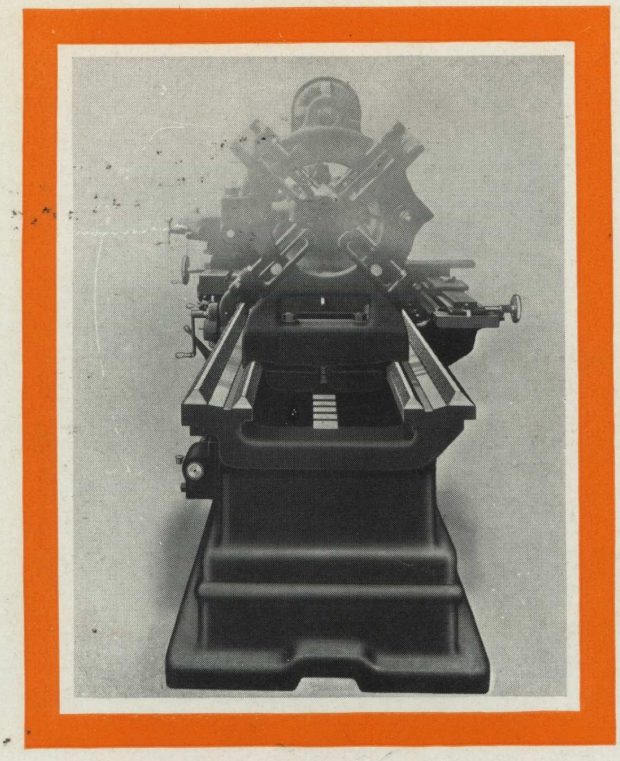
When motor driven either a direct or alternating current motor is mounted on top of the headstock and connected to the initial driving shaft by herringbone gears, which are made of steel forgings. These gears are fully enclosed, and are continuously flooded with oil. A flexible coupling placed between the motor and the driving pinion compensates for the end movement of the armature shaft, and insures quiet running gears with minimum wear. The motor pinion is mounted on S.K.F. double race, self-aligning ball bearings, and the whole unit, being completely enclosed, is kept free from dust and dirt, and is practically noiseless. This represents the very latest and most efficient motor drive connection that has as yet been developed.


AMERICAN
30 IN
THE AMERICAN TOOL WORKS CO
CINCINNATI, U.S.A.

"AMERICAN"

The New Super-Productive
30-Inch
Triple Geared Lathe





THE BED

MULTIPLE DISC STARTING CLUTCH AND BRAKE, IN OIL

The powerful hardened steel multiple disc starting clutch and brake are incorporated in a detachable unit, which is located in the driving pulley of belt-driven lathes or in the large motor gear of motor-driven lathes. The unit is fully enclosed, is mounted on anti-friction bearings and the clutch and brake mechanism operates in a bath of oil.

MECHANICAL APRON CONTROL

A mechanical apron control for operating the starting clutch and brake is furnished as regular equipment. This is operated by a lever located on the right-hand side of the apron, by means of which the operator is enabled to instantly stop and start the spindle from his position at the apron.

ELECTRICAL APRON CONTROL

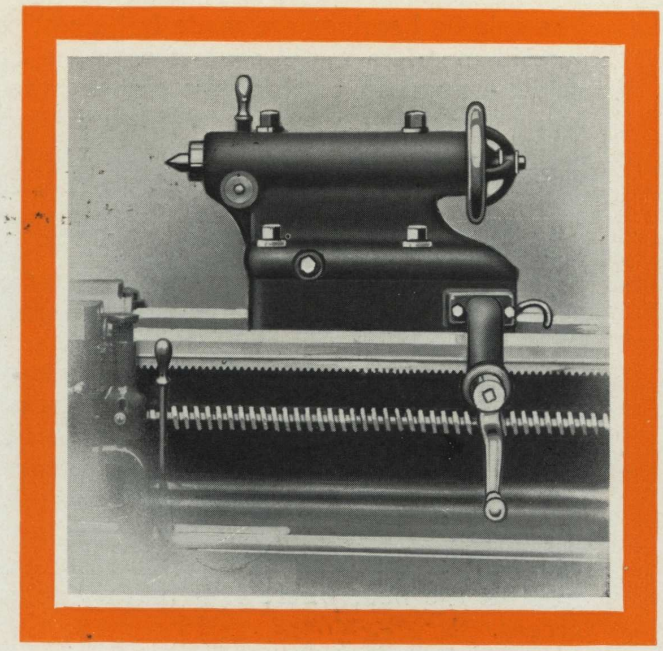
For adjustable speed motor-driven lathes having a fairly long bed it is desirable to equip the machines with an electrical apron control. This enables the operator to start, stop, reverse and to vary the motor speeds from the apron position.

THE BED

The bed is of our patented drop "V" type giving additional swing over the nominal swing and permitting an exceptionally deep carriage bridge. It is ribbed transversely with heavy double walled cross girths spaced 2′ apart. A rib is carried lengthwise in the center of the bed which has a rack cast integral with it. The tailstock is provided with a pawl which engages this rack for resisting the end thrust when heavy work is being turned.

THE TAILSTOCK

Is of our improved four-bolt design, the rear bolts being carried to the top for convenience in clamping. The tailstock spindle is



THE TAILSTOCK

clamped in position by means of a double plug binder which is so constructed as to securely clamp the spindle at any position without affecting its alignment.

POWER RAPID TRAVERSE

A Power Rapid Traverse to the carriage is a very desirable feature on long bed lathes, and especially for turning long shafts. THIS POWER TRAVERSE MECHANISM IS NOT REGULARLY FURNISHED, BUT IS OFFERED AS AN ATTACHMENT. It can be applied either when the machine is built, or at any time after installation, as the mechanism is regularly arranged to receive it.

THE RACK PINION

The rack pinion is withdrawable from the rack—a very desirable feature when cutting coarse pitch threads. The feed rack is 1½″ wide, 5/7 p. and is made of a high carbon, heat-treated material.

GENERAL SPECIFICATIONS

In addition to the improvements already referred to, this new design also embodies the following features, which are now standard equipment on all sizes of "American" lathes.

RENEWABLE BRONZE BUSHINGS

Renewable bushings are fitted into every cylindrical member subject to wear throughout the entire lathe. This applies to all bearings, sleeves, loose gears, etc. Therefore the life and accuracy of alignments can be indefinitely prolonged by renewal of the bushings when worn. The "American" lathe is more complete in this respect than any other lathe. To permit the convenient renewal of worn journal bushings the bronze liners are fitted into cast-iron sleeves, which in turn are firmly seated in the housing. When necessary these sleeves may readily be removed and rebushed. This provides a most convenient and reliable method of renewing worn journals.

SPINDLE BEARINGS

The spindle bearings are made in halves, the caps being given a solid metal to metal contact with the head, and laminated shims are placed between the cap and the head. In order to take up wear in the spindle bearings the caps must be removed and one or more laminations taken out, according to the amount of wear. This not only provides a most reliable means for taking up the wear, but also effectively prevents the operator from tampering with the adjustment of the bearings. These bearings are given a proper running clearance before leaving the factory, and will run for years without further attention.

QUICK CHANGE GEAR MECHANISM

This mechanism provides a very wide range for screw-cutting. However, should it be necessary to increase this range, a convenient means is provided thru the auxiliary quadrant on the end of the bed. This quadrant permits the application of additional gears for cutting special or coarse leads, consequently the screw-cutting range is practically unlimited. The quick change gear mechanism is embodied in a separate unit on the front of the bed, where it is quickly detachable, and easy of access.

STEEL GEARS

Steel gears are furnished throughout the entire machine, those gears subject to severe service being heat-treated and hardened.

APRON

The apron is of complete double-wall construction, consequently all studs are rigidly supported on both sides of the gears. The bearings are lubricated from a channel at the top of the inner wall, from which the oil is fed thru felt filters and tubes to the various bearings. An interlocking device makes it impossible to engage the feed mechanism and half-nuts simultaneously.

LEADSCREW

The leadscrew is 2¼″ in diameter, 1 thread per inch. It is made from a high carbon special screw stock, which is ground to size before machining. The threads are first roughed out to within .015″ of their finished size, after which the screw is laid aside to season. It is then finished from a master screw in a special leadscrew lathe, and is guaranteed to be accurate to within a limit of .001″ per foot for its entire length.

COUNTERSHAFT PULLEYS

Countershaft Pulleys for Belt Driven Geared Head are 20″ diameter for 6″ belt, with speeds forward 472, reverse 537 R.P.M.

REGULAR EQUIPMENT

Regular equipment, on which base price is determined, includes patented 16-speed triple-geared head for belt drive, mechanical apron control, large face plate, compound and steady rests, thread dial, and necessary wrenches.

AT EXTRA COST

We can equip this lathe with taper attachment, turret on carriage, turret on shears, turret tool post, motor drive, power rapid traverse for carriage, follow and full swing rests, countershaft for belt drive, extra gears and index plates for special fine, coarse or metric threads, reversing unit and electrical apron control.

DIMENSIONS

30-Inch Super-Productive Triple-Geared Lathe

Built in any length of bed from 10 ft. up, advancing by 2-ft. lengths

Swings over bed	34½″
Swings over carriage	25″
Takes between centers (10′ bed) with tailstock flush	4′ 0″
Takes between centers (10′ bed) with tailstock overhung	4′ 6″
Front spindle bearing	6¾″x10″
Rear spindle bearing	4⅝″x7¼″
Hole through spindle	2⅝″
Taper of centers, Morse	No. 5
Highest gear ratio	106.7 to 1
Size of tool	1″x2″
Width of belt	6″
Diameter of driving pulley	20″
Revolutions of driving pulley	425
Number of spindle speeds	16
Range of spindle speeds	3.98 to 287
Number of thread and feed changes	48
Lathe cuts the following threads per inch:	½, ⅝, ¾, ⅞, 1, 1⅛, 1¼, 1⅜, 1 7/16, 1½, 1⅝, 1¾, 2, 2¼, 2½, 2¾, 2⅞, 3, 3¼, 3½, 4, 4½, 5, 5½, 5¾, 6, 6½, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 16, 18, 20, 22, 23, 24, 26, 28.
For additional threads, see page	10
Feeds per inch	5 to 280
Ratio of feeds to threads	10 to 1
Leadscrew threads per inch	1″
Diameter of leadscrew	2¼″
Hand traverse to compound rest	9″
Steady rest opening	10″
Net weight (10′ bed)	13400
Crated weight (10′ bed)	14200
Additional shipping weight each additional 2′ of bed	700
Boxed weight (10′ bed)	16000
Cubic feet boxed (10′ bed)	350
Cubic feet boxed each additional 2′ bed	20
Circular No.	43

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